

We claim:

1. An apparatus, comprising an EUVL reticle that includes a substrate with a thin film multilayer coating having a complex-valued reflectance and multiple layer boundaries, wherein the thickness of said thin film multilayer coating has been changed by altering the density of at least one layer of said thin film multilayer coating to introduce a direct modulation in said complex-valued reflectance.
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2. An apparatus, comprising an EUVL reticle that includes a substrate with a thin film multilayer coating having a complex-valued reflectance and multiple layer boundaries, wherein the thickness of said thin film multilayer coating has been changed by interdiffusing a plurality of layer boundaries of said multiple layer boundaries to introduce a direct modulation in said complex-valued reflectance, wherein the multilayer contraction associated with the densification that occurs upon interdiffusion at said multiple layer boundaries is controlled.
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3. An apparatus, comprising an EUVL reticle that includes a substrate with a thin film multilayer coating having a complex-valued reflectance and multiple layer boundaries, wherein the thickness of said thin film multilayer coating is changed by interdiffusing at least one layer boundary of said multiple layer boundaries, wherein the multilayer contraction associated with the densification that occurs upon interdiffusion at said at least one layer boundary is controlled.

4. The apparatus of claim 3, wherein the multilayer contraction is controlled with a localized energy source for producing energy for activating said interdiffusion.

5. The apparatus of claim 4, wherein said localized energy source comprises an electron beam source for producing said energy in the form of an electron beam.

6. The apparatus of claim 5, further comprising means for focusing said electron beam.

7. The apparatus of claim 4, wherein said localized energy source is selected from the group consisting of an electromagnetic beam source, an electron beam source and an ion beam source.

8. The apparatus of claim 7, further comprising means for focusing said energy.

9. The apparatus of claim 4, wherein said localized energy source comprises an electrode.

10. The apparatus of claim 3, wherein said thin film multilayer coating comprises Mo/Si.

11. The apparatus of claim 7, further comprising means for adjusting the energy dose of said localized energy source for controlling the decrease in thickness of said multilayer coating.

12. The apparatus of claim 7, further comprising means for adjusting the energy dose of said localized energy source to control the decrease in film thickness with sub-nanometer accuracy.

13. The apparatus of claim 7, further comprising means for controlling the lateral spatial resolution of the localization of energy deposition produced by said localized energy source.

14. The apparatus of claim 4, further comprising means for adjusting the exposure time of said localized energy source for controlling the depth of the deformation.